CLAIMS

We claim:

1. A brine valve mechanism which controls the supply of brine to a conditioning tank during a regeneration cycle and the supply of water to the brine tank at the end of the regeneration cycle, the brine valve mechanism comprising:

a) a conduit in communication with the conditioning tank;

b) means for withdrawing brine from a reservoir comprising a passageway in communication with the brine; and

c) means for supplying water to the brine tank wherein the brine tank includes a brine well in communication with a brine reservoir, the means for supplying water comprising a first nozzle and a second nozzle in communication with the supply of water, the first nozzle supplying water to the brine well for diluting the brine in the reservoir after the regeneration cycle, the second nozzle supplying water to a salt material disposed over the reservoir for replenishing brine in the reservoir, the ratio of a flow of water from the second nozzle to the first nozzle is at about 6:1.

2. A brine valve mechanism which controls the supply of brine to a conditioning tank during a regeneration cycle and the supply of water to the brine tank at the end of the regeneration cycle, the brine valve mechanism comprising:

a) a first conduit in communication with the conditioning tank;

b) means for withdrawing brine from a reservoir wherein the means for withdrawing brine comprises a one way valve, an air check immersed in a volume of brine, and a second conduit connected to the valve and the air check such that there is a fluid passageway with the conditioning tank, the valve comprising a flexible membrane, a piston and a spring operatively connected wherein the supply of water causes the flexible membrane to flex and exert a pressure pulse on a volume of liquid in the second conduit whereby the volume of liquid displaces a float from a seat in the air check; and

c) means for supplying water to the brine tank wherein the brine tank includes a brine well in communication with a brine reservoir, the means for supplying

water comprising a first nozzle and a second nozzle in communication with the supply of water, the first nozzle supplying water to the brine well for diluting the brine in the reservoir after the regeneration cycle, the second nozzle supplying water to a salt material disposed over the reservoir for replenishing brine in the reservoir, the ratio of a flow of water from the second nozzle to the first nozzle is at about 6:1.

3. A method of operating a water treatment system that includes a pair of ion-exchange water softener tanks connectable to a source of pressurized water and with a water system to supply softened water to the water system, the tanks each being capable of regeneration by flushing with a regeneration solution to replenish depleted ions, the method of operating the water treatment system, comprising:

a) regenerating a selected one of the tanks with a brine solution wherein hard ions are removed from a resin in the tank and exchanged with soft ions, the brine solution being contained in a container in communication with the selected tank wherein the container includes a salt material disposed on a screen above a brine reservoir and further includes a brine well in communication with the brine reservoir, the brine reservoir defining the brine solution;

b) replenishing brine after the brine regeneration cycle is complete wherein the step of replenishing the brine includes ;

(i) flowing water from a first nozzle directly into a brine well of the system for initially diluting the brine in the reservoir, and

(ii) flowing water from a second nozzle directly onto a salt material for generating additional brine solution in the reservoir.

4. The method according to claim 3, wherein the water flow rate through the second nozzle is in the range of about four times to about eight times the water flow rate through the first nozzle.

5. The method according to claim 3, wherein the flow rate of water through the second nozzle is about six times greater than the flow rate of water flowing through the first nozzle.

6. A mechanism for producing a fluid pulse in a conduit used to draw solution from a reservoir, comprising:

a) structure defining a chamber slidably supporting a piston;

b) a biasing element for urging said piston towards a first position;

c) said piston including at least one piston passage for allowing fluid flow from a first fluid passage to a second fluid passage;

d) check valve carried by said piston for controlling fluid flow through said piston passage, such that fluid flow from said first fluid passage to said second fluid passage is permitted by said check valve; and,

e) said check valve inhibiting fluid flow from said second fluid passage through said piston passage, such that fluid flow out of said second fluid passage exerts a force on said piston causing said piston to move away from its first position and producing a fluid pressure pulse in said first fluid passage.

7. The mechanism of claim 6, wherein said first fluid passage communicates with a check valve which is opened in response to said fluid pressure pulse.

8. The mechanism of claim 7, wherein said mechanism forms part of a brine system and operates to unseat a ball check valve that controls the communication of brine solution from a reservoir into a brine supply conduit.